

AMERICAN JOURNAL OF PHOTOGRAPHY

THOS. H. McCOLLIN, Managing Editor.

JULIUS F. SACHSE, Editor.

VOL. XV.

SEPTEMBER, 1894.

No. 177.

PRESENT AND FUTURE POSSIBILITIES OF PHOTOGRAPHY.*

BY LEON VIDAL.

TO render an account of the present state of photography presents no difficulties whatever, the facts to its credit being recorded everywhere, so that we need only draw from present sources, the very ancient facts being, so to speak, contemporaneous, in order to trace a complete history of photography up to the present hour, passing in review all its methods, all its countless applications.

And while we are desirous of justifying the very title of this paper, the circumstances allow us to omit the past, assuming it to be well known to all of us; in order to arrive at the conclusion as to the future possibilities which we are able to foresee, combining the progress of photography itself with the science of to-day.

We are witnesses of a scientific progress so continuous and wonderful, that it would be rash indeed, even if aided by the most exalted imagination, to indicate the more and more extraordinary facts, reserved to us even by the nearest future. New discoveries in the domain of general science will, without fail, result in unexpected photographic inventions, or in applications of photography to uses of which at the present time not the slightest idea can be formed. This is why we cannot approach the difficult

* Read at the Congress of Photographers, Paris, France.

subject which has been referred to us, without a strong sentiment of our complete inability; in other words, this is a new world, inaccessible, which we set out to explore; we would have to give proof of the fervor of our imagination, of a kind of foresight, more than of true science. We would be well inspired, if we could embark on a journey to the beautiful land of dreams to talk to the fairest fairies, and would return to describe our visions and to explain the most fantastic and most wonderful facts, while now we are obliged to appeal to reason—to the reason of to-day, it may be well understood, for our reason changes its basis at every moment according to the conclusions it has to draw from evidence and facts, which yesterday it denied and thought wholly impossible.

But enough of philosophical contemplations, to which, however, we were prompted by a prudence which every one will appreciate.

Being thus under the protection of the unforeseen we may now venture suppositions as fantastic as possible and become prophets without much merit of our own, since the past serves as guide in discovering future possibilities, which, hypothetical as they are, may be admissible because it has been shown that we need not doubt anything in the course of scientific facts.

The past belongs nearly exclusively to monochromy, designating thus any method which by the aid of light produces an image of only one color, whatever color this may be, and even images with more than one color, obtained by the aid of monochromy, each having its own color.

The progress in this line has been very remarkable, especially since the production of single images took the place of a multiplicity of copies.

First, the paper prints obtained by a chemical process from one and the same plate; then the commercial prints, obtained in a mechanical way with plates prepared by the aid of light, have made photography one of the most ingenious and faithful auxiliaries of the art of illustrating all kinds of publications; in one word, the automatical means of copying the most wonderful and most instructive objects which have ever been imagined. On

the other hand, the considerable increase of sensitiveness of the products exposed in the camera to the action of light, together with the invention of the dry film and the consequent portability and easy management, have caused an immense expansion of this art, which now, in every respect, is in the reach of all.

Science has, not less than art, profited by the progress of photography, which made it an indispensable aid for its most delicate researches. To prove this we only need observe the excellent and unsurpassed services rendered by it to astronomy, to physics, to the study of the infinitely small, to the rapid and complete registration of all phenomena of light and motion, even of the wonderful rapidity of the minutest organisms. Indeed, there is at the same time an eye and a draftsman. Like the eye it is gifted with the highest rapidity of vision, so much so that it sees objects as though they were stationary, though they are alive with miraculous swiftness. Ah! it even sees what is invisible to the human eye! The stars bear witness—which, though unknown till now, have been discovered by the photographic eye, in the depths of space inaccessible to our most powerful telescopes. The reproduction of ultra-violet rays bear witness—which, for our power of vision, belong to the invisible.

As a draftsman it is unrivalled; for nothing equals the definition of the lines it traces, the accuracy of the endless details it reproduces, the truth of which is such that it has the force of an evidence of a witness. We may add that it is also an artist. Indeed, thanks to entirely successful researches we are able to obtain impressions on the sensitive medium by the aid of light of all colors, in proportion to the degree of luminosity of the different colors.

This progress was achieved but slowly, and now that it has become an accomplished fact and practically within the reach of all, it gains ground slowly, but this can be only a question of time. Since we are able to sensitize our products so as to render them acceptable to impressions of all colors—giving them a perfect orthochromatism—it must also be possible to render them more sensitive to one color than to another.

This possibility of selection must lead to the production of monochromes corresponding to every one of the principal colors, and consequently to the representation of the color effect of an object of nature, by superposition of the different monochromes, each having its own color.

Therefore, photography, being the most skilled draftsman and lithographer and the most admirable engraver, is also a wonderful expert in colors. But it is even more than this, it is already the artist of entire pieces of art, producing by one single action the colors of objects much as it impresses the sensitive monochromatic plate.

And what a really wonderful idea—we begin to trace on the sensitive film the true image thrown into the camera, with its reality of detail and colors. And this is our present position.

The development during more than fifty years has been nearly completed, because we have succeeded in passing through all possible phases of the art of designing and of its applications, attaining even to the art of painting.

We say "attain," by which is not meant that we have advanced in the subject of color-photography to a point which we did not gain in monochromatic reproductions.

The most characteristic name which might be given to the present epoch is that of a new era. We are on the threshold of the art of Polychromy. Indeed, in scientific applications the first step counts most, as perhaps it does in every other field. We have only to direct our attention to what is going on in the electric world and then to proceed by analogy. There we have arrived at a point at which even the most fertile imagination could not pass beyond the scientific wonders of the future, even if its flight would lead us into the most fantastic dreams.

No doubt electricity, with its powers, its invisibility, its enormous rapidity of propagation, will become an ally of photography to aid in the creation of unexpected wonders. Already they speak of plates exposed and developed by the aid of an electric current. Edison is at work to construct an instrument intermediate between the phonograph and his kinetograph, which will enable us simultaneously to see the motions of a person, to hear his

voice, his words, put in immediate harmony with gesture, his attitude, the play of his lips and eyes, etc.

This has not only been taken into consideration but can be realized—probably it is realized—at this hour. But this is not all. By electricity similar effects may be and are (why not speak affirmatively since such is our opinion?) transmitted over a distance.

Thus, using the electric telegraph at the same time as telephone and as kinetograph, we will be able to communicate the complete effect of form, motion and sound to points far distant from the scene of action.

So far we have spoken of the form, which involves the idea of outline and details of objects. Will a transmission of colors become possible? Will we be able to complete the characteristics of an object by communicating through the electric wires not only its outline but also its colors?

Why should we not admit this possibility, extraordinary as it may seem? How to get there? This is the point which no one as yet knows, but considering the present state of our scientific resources, based on the divisibility of matter, it does not seem impossible that we may arrive at results of this kind.

Passing in review the history of development of electricity, are we not convinced that about fifty years ago no one would have believed a prophet of the future, foretelling all the present wonders of the spark?

We do not burn the wizards any more, at least in civilized countries, but they are still treated as fools.

Well! We can no longer denounce folly in view of scientific predictions of the most revolutionary character.

All we are allowed to say is this:

"*Who can tell? This may be very possible.*" Thus we do not risk to engage in a dispute which sooner or later will be decided against us by the facts.

Speaking of the progress of photography which may be realized, we think at once of a higher sensitiveness, which would allow of instantaneous impressions even with the feeble light of interiors.

The sensitive product, or at least its vehicle, shall have the fineness of the collodion or albumen film.

The apparatus, perfect as it is, still shows an incessant tendency to improvement.

From the standpoint of expanding the field of photography until it reaches every home, the idea will always be an apparatus essentially portable, of small weight and volume, permitting us to photograph without being observed, and containing a number of plates or flexible films, sufficient for a large number of successive exposures.

The favorite of the future is evidently the flexible film or the very small plate, so that after a sufficient perfection of rolling apparatus an endless ribbon may by advantageously substituted for a certain number of single plates.

The rolling device lends itself better to a rapid succession of new sensitive surfaces, but its operation must be made more reliable and easier.

This evidently is a field for the future.

The future will find enough work in the development of photography, and persons who believe that very little is left to extend its field are badly mistaken.

Well, what is it, they ask? There is the question of colors, and, saving some perfection in details, that is all, isn't it?

First, in regard to colors, it is by no means a small step forward to bring this branch of reproduction to that degree of perfection which we have obtained in monochromes.

If such a great step has been taken, inducing us to believe in a possibility of reproducing colors, and proving that the means of direct reproduction of colors exist, it is not less true that all is done with a view of applying it to industrial uses, either to obtain simply and easily direct phototypes from nature, or to multiply polychromes with the aid of the phototypes.

The very day this possibility is recognized and justified by facts, nobody will do anything but take polychromes.

But the perfect realization of this hope will come without extensive further researches.

HOW A LENS DOES ITS WORK: A LESSON IN
ELEMENTARY OPTICS.

CLEMENT J. LEAPER.

A CERTAIN substance is believed by all scientific men to be present everywhere. We cannot see it, although we have reason to think that without it we could not see at all: we cannot weigh it, although we know we are right in saying that it cannot be without weight. This apparent paradox is the æther of the physicist.

Whether it really exists or is only a fiction time will tell, but we are at least certain that all phenomena in which light or heat play a part can be explained on the assumption that the æther is as real as water or as air. This æther can be set in motion in various ways, and when set vibrating at a certain rate our eyes interpret its motion as light, and the photographic plate changes the motion into a developable image.

Vibratory motion or vibration means motion taking the form of waves: motion in which the moving substance is not bodily transferred from one spot to another, but in which a wave travels instead of the body itself.

We have in the waves of the sea an example of motion of this kind; the wave advances and breaks on the sea-shore, but the water itself merely moves up and down. Waves are conveniently represented in direction by straight lines, and these lines we call rays.

If we pierce a small hole in the shutter of a darkened room, taking care that the shutter faces the sun, we shall find that when a piece of paper is placed in a certain position opposite the hole, an image of the sun will be visible on it.

If we enlarge the hole, we shall find that the image becomes less and less distinct at the edges, although brighter all over, and that finally when the hole is made sufficiently large the image of the sun is replaced by an irregular patch of light.

What explanation can be given of all this? Light travels in straight lines from the sun to the sheet of paper, and to do so

must obviously pass through the hole. (We speak of light passing through the hole when we really mean that a wave giving rise to light passes through.)

Let us in imagination divide the sun's circumference into four equal parts by means of two diameters bisecting each other at right angles, and let us call the extremities of these diameters A B C D. In order that the point A may form a distinct image on the sheet of paper, it will be necessary that the wave or simply the ray proceeding from A to meet the paper at one spot only. If we cause to fall on the same spot, the rays coming from B C D, we shall get an indistinct image, as each ray will form the image of the point on the sun's surface at which it originated. It is now easy to see why the size of the hole must influence the distinctness of the image.

If the hole is sufficiently small the rays are prevented from overlapping, if not so small the rays overlap to a certain extent, whilst if the hole is still further enlarged we get not one, but a series of images, none of them distinct. If we confined ourselves to a hole of the size requisite to obtain a distinct image, we should find that the position of the screen would exert little or no influence upon the distinctness of that image but would exert a good deal of influence upon its size.

The nearer the paper to the hole the smaller would be the image, the further the paper the larger the image.

What is true of the sun would also be true of any illuminated object placed opposite to the hole, a landscape for instance; and the experiment made in this way would reveal the fact that the image is invert, a proof that a wave produced in aether cannot bend round a corner. The darkened room with the hole in the shutter is really a very large camera, and a sensitive plate placed where the paper is supposed to be would under suitable conditions be impressed with a developable image. If we substitute for the darkened room an ordinary camera and for the hole in the shutter a piece of tinfoil pierced with a circular aperture supported in the position usually occupied by the lens, we have all that is needed for the production of so-called pinhole photographs.

It is sufficiently obvious that a small hole, indispensable if sharpness is wanted, means very little light, and in practical photography we want for many reasons all the light we can get.

The problem we have to solve in such a case is this: Given a hole an inch in diameter and a screen opposite to it, how are we to arrange matters so that a distinct image of whatever is opposite the hole may be formed on the screen? We do this of course by using a lens in the hole, when we find that a distinct image is formed on a screen placed at a certain distance from that lens. How does such a lens do its work? Evidently by compelling all the rays proceeding from any one point on the image, to fall upon one and the same point on the screen. A lens in its simplest state is a piece of glass so shaped that its surfaces form part of two spheres.

A ray of light passing from air to glass is bent, and the curves of a lens are so adjusted that all rays proceeding from any one point in front of, meet at a certain point behind it. An illuminated object is really an assemblage of an immense number of points of light. When a large hole is used their images overlap. A lens sorts these images and prevents them from overlapping.

If we draw on paper a line A B an inch long, and then draw diverging lines from each extremity of the line, we have got a rough representation of the waves emitted by a luminous line A B. If we draw another line C D parallel to A B so as to cut these radiating lines, we shall have a rough representation of a screen placed in front of the luminous line A B.

In such a case no distinct image is possible, but a pinhole or a lens placed between A B and C D, will obviously prevent the line from overlapping, and so secure a distinct image of that object to fall on a screen placed at a certain distance behind the lens. A moment's consideration will show the reason of this.

If the distance between a certain lens and the screen is in one case less than the distance between another lens and the screen in a second case, we shall find that with the first lens a smaller image will be obtained than with the second; the nearer the screen the smaller the image, and vice versa. The degree to which a lens will bend a ray of light falling upon it depends

upon the kind of glass used and upon its curvature. A short focus lens bends the rays very much, and forms a small image at a greater distance.

It will be observed in conclusion that although for convenience we have spoken of the lens as forming the image, what we really mean is that the lens so bends the rays as to prevent the already formed images from overlapping.

The image is really formed not by the lens, but by the waves set up in the æther.—*Photographic Answers.*

THE PHOTOGRAPHY OF DIFFICULT SUBJECTS.

THERE are some subjects that cannot be photographed in the ordinary simple way without losing much in the result that a little extra manipulation might have secured. It may be considered that the setting forth of the advantages of a certain amount of extra-photographic work is a plea in favor of retouching, but this we cannot by any means allow. It would be great folly to reject a negative because of a pinhole or two that might easily be stopped up with a touch of Indian ink, for fear the practice might lead to the evils of retouching. And there are other ways of mitigating or getting rid of difficulties that are perfectly legitimate in certain cases, and interfere in no way with the right of the worker to call his finished result a real photograph.

One of the commonest difficulties met with is the wideness of the range of the luminosities of the subject. The various cases in which this occurs differ so much in character that the photographer is apt to overlook the fact that they have a common origin. It is the duty of scientific photographers to meet difficulties, to discover exactly how far they are irremovable, and then to find, if possible, how the inherent shortcoming may be made less obvious. We hope that there are some art photographers who feel impelled in the same direction, though there appears to be a decided tendency on their part to leave some difficulties

altogether alone, if we may judge by the pictures recently shown and the advice tendered by some of the foremost picture makers. It is difficult to represent daylight effects with the colors at command, still more difficult in monochrome, but that it is not impossible has been proved over and over again. But latterly our art photographers seem to have quite given up the attempt, and they devote themselves chiefly, if not exclusively, to evening effects, misty views, and such like. Where there is sunshine it too often looks like a poor moonshine, and is discernible only in the cast shadows. There are ways, perhaps chiefly of an indirect character, of getting an appearance of daylight in a picture, but this is a matter for artists to discuss.

A more simple case is a bright sky with a fairly dark landscape. The easiest way is to neglect the sky altogether, and print in another one. It is quite possible to get both the sky and the landscape on the same negative, so that they will both print without loss of detail, but this means a loss of brightness and vigor in the landscape by compressing its tones into a short range to keep room for the sky in its proper relative position in the scale of brightness, and a flatness of the sky for an analogous reason. If now a richly-coated plate is taken, and the landscape made the best of by careful development, the sky will also be rendered on the negative, but it may be too dense to show on the print. By pasting a piece of thin paper over the landscape it may be so retarded in printing as to allow the sky to show. Such a method, if equally successful, is preferable to printing in a separate sky. The only effect is that the brightness of the sky is brought nearer to the brightness of the landscape; the difference between them is lessened. Something must be given up, and it appears that the approximation of the brightness of the sky as a whole, a very common practice with artists, is the least objectionable sacrifice. For this purpose "papier minérale" serves excellently, and we prefer to stick it on the glass side of the negative with starch paste applied over the whole surface, and then to cut round the desired limits and scrape and wash away what is not wanted. A similar case may occur in portraiture when the model has a white dress. It is possible to photograph

the dress and the face together, but in almost every case this will lead to a loss of richness in the half-tones of the face, and often to the flesh appearing of an unduly dark color. By allowing development to proceed until the best is made of everything excepting the dress, and then by using the means described to get the detail of the dress without overprinting the rest, the difference in the lightness of the dress and the other parts of the subject may be reduced without loss of vigor in either. It is obvious that this method must not be carried to excess, and its justification lies in the fact that in the representation of such subjects as those instanced by any pictorial method, something must be given up, and it appears desirable that where a very definite part of the subject is considerably whiter or more luminous than the rest, it is often preferable to diminish the excessive contrast between the two parts rather than to lose vigor in either or both.

Reflections from bright surfaces are almost always troublesome, and here again it is very necessary to take care that in getting rid of the difficulty the photograph is not made false. The use of a polarising arrangement has recently been recommended for this purpose, and it is generally effective because reflected light is often, at least, partly polarised. But the human eye does not quench polarised light, and it is therefore possible by using a Nicol prism with the lens to get a photograph that is strikingly false when compared with the subject, though the falseness may not be observable when the photograph is inspected alone. One or two examples will show the kind of falseness that is to be feared. By looking at a wooden table standing in front of a window the surface-appearance of the wood may be nearly hidden by reflected light, but when looked at through a polarising arrangement the shining appearance may be so far lost that every unevenness of the wood becomes clearly visible. To lose this reflection and gain this detail in a picture would be false. On the other hand, if a machine is being photographed with the only aim of showing its details, the light reflected from bright parts of it may be quenched with advantage, because a true picture or representation is not required, but only a diagram of details. For this reason the dulling of bright parts is permissible, though

the dulling confers an untrue appearance. And when pictures are being copied, whether they are glazed or not, the shiny reflection from the surface must be got rid of somehow, because it forms no part of the picture. But if an interior is being taken, and the picture is only an item in the photograph, to quench such reflected light would be wrong, because it would give an impossible effect. The falseness would be analogous to, and just as blame-worthy as, the photographing of a man with empty spectacle frames on his face, or the removal of the glass from the windows of a house that had to be photographed. Recourse to such practices shows either incompetence, or a want of artistic taste, or the want of a knowledge of the fitness of things, or perhaps all three together.

The shiny reflection of light from foliage is very necessary in a picture whenever it is noticed in nature, and though it may perhaps be with advantage subdued for the reason given in the landscape and sky example referred to above, it must not be done away with. If it is not wanted, the point of view must be shifted, or the lighting altered, but if the photograph is taken under those conditions that show the reflection, and the reflection does not show in the photograph, the photograph is false, because it shows an impossible combination of effects. There are other difficulties and other means of escaping from them that might have been discoursed of had our object been to give practical formulæ, but we have sought to discuss the principles that should guide workers as to the way in which they should meet difficulties; and probably no further examples would advantageously bear upon this phase of the subject.—*C. J. in Photography.*

Dr. Zergler, a German scientist, is of the opinion that it will be possible to predict the weather by means of photographs of the sun far more accurately than by a study of the barometer. Circular or elliptical halos round the orb of day, he says, indicate violent storms, especially if the halos are dark in tint or of a large diameter. Lightning and magnetic disturbances may also be expected from these signs.

DUSTING ALBUMEN PROCESS.

HENRI CALMELS.

FOR the production of process blocks the method of printing with bitumen is undoubtedly the one to use, on account of the sharpness of lines, neatness, and resisting power to the different etching fluids. But the time required for the exposure, with the uncertain light in this country and the expense of artificial light, renders that king of the processes out of the question for the trade.

Among the numerous Bichromate processes, the Albumen process seems to be in general use by nearly every firm in England.

The Albumen method to be described—with a thin coating and well treated—produces sharp, neat lines, and also a perfect resistance to any strength of etching fluid. Moreover, this method of treating Albumen allows us to work upon any metal.

The practical man who has a formula giving satisfactory results need not change it, but as my object is to be useful to beginners, as well as more experienced men, I give some formulæ:

Water	10 oz. = 10 parts.
White of egg	1 oz. = 1 part.
Bichromate of potash sat. sol.	1 oz. = 1 "
Bichromate of ammonia sat. sol.	$\frac{1}{2}$ oz. = $\frac{1}{2}$ "

OR

Albumen	1 oz. = 48 parts.
Water	10 oz. = 480 "
Pulverized bichrom. of ammonia 80 grs. =	8 "

To make up one of these formulæ, take a clean bottle, and put in it some broken pieces of glass, then the white of egg, water, and bichromates, and shake the bottle for about one minute. Allow to stand for two hours, then filter the solution through cotton-wool before using it. This solution will keep in working order about two days; to keep longer, add a little citric acid.

For printing on zinc, the plate should be nicely polished, and flat. Spread upon the surface some whiting or very fine pumice-

powder, and rub with a clean piece of rag dipped in water. Rinse the plate under the tap, and wet it for about one minute in a bath composed of

Water	40 oz. = 1760 parts.
Nitric acid	$\frac{1}{2}$ oz. = 22 "
Alum	$1\frac{1}{2}$ oz. = 66 "

rinse it again under the tap, and rub with a pledget of cotton-wool to remove the deposit formed by the acid.

Then flow over the face of the plate the albumen solution, pour off the excess into the sink, flow again, and turn on the whirler at a medium speed. A too high speed will form a sort of star in the centre of the plate. When turned for about half a minute, take the plate off the whirler, and dry by moderate heat. When cold, the plate is ready for exposure.

Copper and other metals, on account of their affinity for fatty substances, are sometimes preferred by printers, and this affinity is one reason which prevents their giving prints with albumen the necessary strength of resistance to any etching baths.

The advantages of the Dusting Process are not only to simplify and increase the qualities of the Albumen Process with zinc, but also to apply its use to other metals, which, however, have to be treated in a different way from zinc.

The plate should be always highly polished and flat, and, before coating, it should be rubbed over with a clean piece of rag dipped in zinc white, and rinsed under the tap carefully, then coated with albumen, as described for a zinc plate. If at the first flowing the solution does not cover the whole surface of the plate, cause it to run by driving it with a piece of blotting-paper.

The exposure to the sun should be from two to five minutes according to the negative.

Before taking the plate out of the frame, the ink-slab, gelatine roller, and knife should be cleaned, and a clean flat board be ready to rest the plate on for rolling up. Take on your knife the necessary quantity of re-transfer ink or photo-transfer ink, thin it down with highly rectified turpentine, then take your plate out of the frame, rest it on the flat board, distribute the ink evenly on

the roller, and roll up the plate until the turpentine has completely evaporated. The plate should appear of an even darkish grey color. Stand it for one or two minutes in a dish of clean water, and rub the surface gently with a pledget of cotton-wool. When the small whites in the shadows are well out, rinse the plate under the tap, and dry it as rapidly as possible. Moderate heat can be used to accelerate the drying. When dry, carefully apply the dusting powder, as given below, with a very soft camel-hair brush. When the picture is quite covered, clean away the excess, which would make spots in the white parts. When the white parts are free from powder, heat the plate over a stove or gas-burner—only small plates can be heated over the latter, as large ones would not keep flat. When the picture becomes glossy, the powder is melted, and the plate has the appearance of a bitumen print. It is now allowed to cool, and all retouching can be done with litho-writing ink or other fatty ink, and submitted to its proper etching fluid, according to the metal used. It will resist any strength of bath, and will give sharper lines or half-tone than any other method of treating albumen.

The Dusting Powder has to be well absorbed by the image, and the bitumen to be of good quality. Bitumen in excess will not cover the picture well, and some parts will be grey after etching. Fatty bitumen will cause a loss in sharpness.

Formula:

Bitumen of Judæa (pure)	60 parts.
Black pitch	25 "
Resin	15 "

Melt in an iron sauce-pan over a gas-stove—it will take some few hours to mix completely. The mixture must be carefully watched, and stirred as often as possible. When completely mixed, pour it on a slab, or into cold water, and then powder it until it becomes impalpable.

N.B.—I shall be pleased to be informed of any failures by those who work the process.

Arrangements have been made with Messrs. Penrose and Co. to supply the dusting powder.—*Photogram*.

CONVENTION EXHIBITS, P. A. OF A.

EVERY one in attendance at this Convention were unanimous in the expression that the advance made by photography the past year is greater in some respects than it has been the past ten years. The progress made has been to greater perfection in the direction of art photography, and the young men of the profession are coming so rapidly to the front that it makes the older heads feel that they can no longer claim a monopoly on high grade art productions.

The pictures on exhibition in both the art department and by the various plate and paper makers were of a high order, and it was noted and often remarked that few, if any, really poor examples of photography were on exhibition. One could sit for hours before any one exhibit in the manufacturers' department—where a greater variety could be viewed at once—and study effects in the different branches of the art, and then not feel as though he had looked half long enough.

There was little display among the dealers compared to some previous conventions. Mr. J. C. Somerville and Mr. Hyatt, of this city, made very creditable displays of apparatus and accessories. Dealers have about come to the conclusion that large displays are not necessary, and are unprofitable.

The A. M. Collins Manufacturing Company had an elegant display of the various styles of card stock, also showing the different styles of embossing and imprinting on the mounts, of which nothing handsomer can be obtained anywhere. The Collins Company is the largest of its kind in this country, employing between 800 and 1,000 hands. The exhibit was in charge of Mr. O. W. Wood.

E. & H. T. Anthony & Company exhibited an electric-light apparatus, which was often demonstrated. The Williams flash-light apparatus was also exhibited by this firm. Many elegant proofs of its work were to be seen around the hall, some from Paris and Berlin. Mr. Richard Anthony was present during the Convention.

Sweet, Wallach & Company, of Chicago, exhibited a flash-light apparatus and some backgrounds.

The Dorticus Manufacturing Company exhibited a perfect mounting and embossing press, which attracted wide-spread attention. We were informed that large orders for this press were booked, some single orders calling for sixty presses. This press, unlike any other on the market, opens clear back, giving full access to the dies, and for mounting prints the work is perfect and rapid. As a mounter alone it is worth the price asked.

Carl Ernst & Company made an exhibit of German card stock. The Acme Burnisher Company showed their new heating apparatus for burnishers.

L. C. Overpeck, with his Seavey background carrier, attracted much attention. This carrier has been improved since its exhibition at Chicago last year.

The Mallinckrodt Chemical Works had on exhibition a fine lot of chemicals from their extensive plant in this city.

The Standard and Record Dry Plate Companies were represented, and gave out sample boxes of plates.

Clifford's flash-light apparatus is a new candidate for flashy favor. The manner of the flash is such that every particle of powder is consumed, and with little or no detonation. The apparatus can be divided when the full power is not required, which is often desirable.

The Walpole Chemical Company had on exhibition their new-process hypo, together with a variety of their perfectly pure chemicals used in photography. The price of some of these chemicals is necessarily a few cents higher than the ordinary kind, but in the end they are much the cheaper, as there is less waste, better work, and the solutions more readily prepared. We have some chemicals for trial, which will be reported on later.

The Walpole Chemical Company are the only manufacturers of hyposulphite of soda in this country. By the use of their new process hypo, there will be nothing more heard concerning the ill-effects of hypo on the prints. Where prints are well fixed in this new process hypo, a half hour's washing will be all-sufficient, and no trouble will ever occur from the hypo.

Clinedinst electric-light apparatus was much admired for brilliancy and soft illumination. The shadows in the portraits appear to be properly illuminated. Certainly the light is very powerful, at the same time soft and not fatiguing to the eyes. The illumination seems to be very even and perfect.

The Johnson background carrier is on somewhat different principles from other carriers, in that it requires but one crank, as an attachment to prevent stretching the canvas at the edges, thereby causing the ground to wrinkle. The scene, when unrolled, does not come in contact, nor interfere with other rolls. It appears to be a very perfect carrier, and requires only to be made known to be largely used.

The Caswell background carrier, which has been on the market for several years, was exhibited by the inventor, who says he now intends to push its sale.

HAMMER DRY-PLATE COMPANY'S EXHIBIT.—The Hammer Dry-Plate Company, while one of the youngest in the business, has grown so rapidly in favor that their plates are already well up in the front rank among the leading concerns of this country. The perfection and regularity of their productions have placed the Hammer plates directly alongside the best goods of the kind made, and surely the display of photographs made at the Convention will bear out this assertion. Work of the highest grade was exhibited from nearly one hundred photographers, many of whom were the best workers in this country. Their display of beautiful photographs was full of gems, rich in the qualities which go to make up a first-class picture. The photo by Foss on Lithium paper which appeared in our Convention number, was from negatives that were "Hammered" out, and a full set of these beautiful prints were on exhibition in the Hammer display.

A. M. SEED DRY-PLATE COMPANY'S EXHIBIT.—The Seed Dry-Plate Company put up an exhibit that was educational in its entirety. Negatives were displayed from which prints were shown from the same negative, on all makes, brands and kinds of paper on the market. Old albumen showed up grandly in

company with the new aristotypes. In this exhibit were displayed prints on Nepera, Solio, Kloro, American Aristo, matt and glossy Photogene, C. & C. Export, Ilotype, matt and gloss, Eastman's Platino Bromide, G. B. Carbon, Willis & Clements Platinum, Lithium, Western Collodion, and Decker Collodion paper. All were first-class prints, proving that the Seed plates will yield negatives suitable alike for any and all kinds of paper yet produced. Aside from the demonstration of this fact, the Seed display was instructive to a high degree, as one could study the negatives and at once turn to the examination of the prints upon any paper the observer may at the time be using, or desire to use, also the different effects produced by the different papers, and compared with others. Again the same negative was printed on glossy and matt surface, platinum and imitation platinum, and by comparison one with the other, the desirable points of each could be seen. Then again certain qualities in the negative could be observed on the different kinds of paper and also compared. In fact the study of this exhibit gave one much valuable information, procurable in no other way, and was a happy combination to place on exhibition at the Convention, and it is to be hoped that all profited by it.

Miss Bessie Huiskamp, an amateur of exquisite artistic abilities, had displayed in the Seed exhibit prints made on Willis & Clements Platinotype paper, made transparent, and framed to view as transparencies. Here was another exhibit which many professionals even of a high order could study with profit, and from which very much could be learned by the great majority of photographers. The lighting was admirable, even for one of vastly greater experience, and the posing would do credit to a Sarony or a Falk. Her landscapes were perfect gems, and well worth a place in any art collection. The Seed Company embraced among the producers of their very superior exhibit, men and women workers high in the profession, and of long experience, as well as those of the younger generation of photographic workers, a large portion of whom are crowding the leaders to a remarkable degree. The Seed Company are to be congratulated upon their success in placing before the fraternity an exhibit from which so much could be learned.

SENSITIZED PAPER.—The paper makers were out in good force, and with large displays. "Photogene" is something new, and is destined to make its way in the world, as the beautiful effects produced on the paper went to prove. We shall probably have more to say of these prints later on.

"Aristos" was represented by I. De Vos, who made a creditable showing of excellent work on this new paper.

Willis and Clements Platinum paper demonstration was a grand success. It made us feel like entering again the ranks, and starting into the production of those beautiful, permanent platinotypes. It was so simple of manipulation it attracted widespread attention.

The Western Collodion Paper Company showed some rich and elegant prints on their K. K. paper. Some of these were toned with a new formula, producing purple brown tones, which were very beautiful, and just what photographers have long tried to produce on Collodion paper. In this exhibit were exquisitely toned prints in all shades from bright sepia to dark brown and purple brown.

The American Aristotype Company surprised the photographers by coming out with a new matt paper, which they style Aristo Platino. The effects produced upon it are rich and charming. The paper will do much towards popularizing matt surface. One could look for hours upon those beautiful prints without tiring. They seemed to fascinate and charm the beholder in a manner which no glossy surface print can do.

The Aristo bloomed out in grand style, large and small prints from hundreds of workers, and prints that seemed to cry out, Seek no further. It has been stated to us in a letter that "tones on collodion paper must of a necessity be of the brick red color; when carried farther towards the brown a disagreeable, dirty yellowish color will appear around the edge."

We are only sorry that the friend who thus wrote to us could not have been present and examined the collodion exhibits. He would have found prints with exquisite tones, all shades, to a very dark photo brown, and no sign of markings around the edges. This aristo exhibit was a grand one.

The Ilotype Company had a most charming display on their Ilo paper, both matt and glossy. Their matt was something different from anything else on exhibition, of exquisite softness, peculiar to itself, and possessed by no other.

The Ilotype is toned in the combined toning and fixing bath, the company recommending no other for their paper. With this bath very rapid work is produced, and, as shown, the results are so beautiful that nothing more can be desired. The company publishes the formula, and guarantees that none of the ill effects produced by other combined baths will ever be observed with the bath recommended by them. They also manufacture it for sale, of which large quantities are constantly being sold. The secret probably lies in the purity of the chemicals used in composition. As the company is connected with one of the largest wholesale chemical establishments in the United States, with chemists in their employ of the highest order, it is not to be wondered at that they are able to produce a perfect combined bath, or produce it in its greatest perfection ready for immediate use, and a paper that is being sold as fast as a five-story factory can turn it out. The Ilotype Company is truly a great concern, manufacturing immense quantities of perfect paper.

The Nepera paper made its first appearance at one of our Conventions. It is a matt surface, with variable tones to suit the tastes of the workers or their patrons. The paper is spoken of very highly, and surely the examples bear out all that is said of it. Most charming effects may be produced at will on Nepera paper, which ought to commend it very highly to the amateur and professional alike.

THE ART DISPLAY.—While there was as fine work displayed, and even duplicated, among the manufacturers' exhibits, yet the art galleries were gorgeous in beautiful photographic productions, and as it was all fine, it will be simply impossible to do more than give a passing mention; a lack of time and space prevents our doing otherwise.

The foreign display, while not quite up to former years, contained some gems of rare beauty, all of which was presented to the P. A. of A., and a request that one of each of the prize ex-

hibits be sent to the address of the President of the German Society, to be placed on exhibition at Frankfort, also Vienna and other places, and any awards received would be forwarded to the exhibitors. Otto Koch, Hussem, sent some beautiful cloud studies, and Carl Segert, Berlin, some beautiful examples of photography by gas light. Some examples in Lichtdruck attracted much attention. They consisted of leaves, flowers, fruit, pinecones, birds, etc., artistically arranged and reproduced.

An enlargement of the great "Last Supper," by Charles Scolik, Vienna, attracted much attention, as also beautiful views by K. Schwer, Weimar; cabinets and photo crayons by F. Langbein & Co., Heidelberg. Some remarkably beautiful views by Obernetter, of Munchen; 18x22 flashlights from Paris and Berlin, with American apparatus.

A large number of other foreign exhibitors sent beautiful pictures, which it is impossible to enumerate for want of space.

Coming to our own country's exhibits, we must be content with mere mention, as all were good.

Seavey & Fowler, New Castle, Pa., exhibited in two classes, and in both the work was excellent.

O. H. Wheat, Rockford, Ill., exhibited some gems which were greatly admired.

Hemperly, of Philadelphia, had the finest collection of colored photos on exhibition. This being Mr. H.'s first attendance he felt flattered at the reception of himself and his work.

Oscar Grosheim, Muscatine, Iowa, displayed some excellent examples of his photographic work, and deserves great credit for such a fine display.

W. N. Brenner, Bucyrus, Ohio, rather outdid his former efforts in his display of fine photos.

Pausch, Saginaw, Mich., had an elegant display of portrait photographs; as also T. Zwifel, of Duluth, Minn.

Bingham, of Memphis, Tenn., displayed some superior examples; and Adams, of Elgin, Ill., was not behind in quality and excellence of display.

Gilbert & Bacon, Phila., showed some fine work, as they always do. The negative work was most excellent.

R. P. Bellsmith exhibited work of a high order, which was honored by the judges.

Frank W. Medler, Iowa, is among our rising Napoleons in the photographic field, and displayed some excellent examples of his genius.

Dabbs, of Pittsburg, made a display of which he may justly be proud.

Brush, of Minneapolis, showed the quality of his photographic productions in a display of good work.

Coover & Co., Iowa, displayed some gems that would adorn any art collection. Sommers, of Memphis, is among the most popular photographers in the South, and exhibited work equal to his popularity.

W. H. Jackson, of Denver, as usual exhibited in various departments his unrivaled views of the new world.

George W. Leas, of Peru, Ind., exhibited most beautiful interiors, and so the judges thought, for they awarded him a medal. Not a sign of halation to be seen anywhere.

John Rosch, White Plains, N. Y., had some charming instantaneous views on exhibition, trotting horses jumping hurdles, children at play in a room, etc.

Thuss Bros., Nashville, Tenn., exhibited some truly beautiful examples of the photographic art.

McCrary & Bronson, Knoxville, exhibited some beautiful work, for which they were awarded an Association medal.

A. N. Camp, Jamestown, beautiful matt surface pictures; after gazing upon so much gloss, it is such a happy relief to come across such a beautiful collection on matt surface.

Proctor, Charleston, W. Va., in his exhibit showed that he knew what constituted good work, and could produce it.

George Steckel is a photographic genius of high order, and produced charming effects in his exhibit, which was the most artistically arranged, so said the judges.

A. McDonald, South Bend, Ind., appeared in the full light of an artistic photographer, and exhibited some rare gems.

G. H. Hastings, Boston, had on exhibition some of his artistic and meritorious productions.

L. C. Overpeck, Hamilton, Ohio, had some fine work on exhibition.

Knafe, Knoxville, displayed some fine genre work that attracted much attention. Bad roads was well illustrated.

Arthur & Philbric, Detroit, were among the prize winners, and deserved the awards, as their work was charmingly beautiful.

Pifer & Becker, Cleveland, always exhibit excellent work, and this time was no exception.

A. H. Plecker, Lynchburg, Va., exhibited five frames of portrait studies, which were meritorious.

S. L. Stein, Milwaukee, exhibited in Cramer's display and the genre class. His subject, "Seben Come Eleben," was perfectly characteristic of the coons it represented in their craps game.

Pirie McDonald, the young artistic photographer, who was awarded the Cramer Cup, displayed the same beautiful work in the art department, which was awarded a gold medal by the Association judges.

G. H. Barnum, Springfield, Ohio, was awarded a gold medal for his most excellent exhibit.

James Inglis, of Chicago, was awarded three prizes. His exhibit consisted of bromides plain, and finished in sepia and colors, and was without question the finest exhibit ever issued from the Inglis Studio.

There were numerous other exhibits, to many of which the proprietors' names had not been affixed, and we were unable to note them, but the exhibits were all grand and beautiful, and those who failed to receive a prize can have the satisfaction of knowing that those to whom the awards were given did not win them easily.—*W. H. Clark, in St. Louis and Canadian Photographer.*

Notwithstanding the numerous developers placed upon the market recently, the well-known and long-established pyrogallic acid manufactured by E. Schering, of Berlin, Germany, is so universally preferred by professionals and amateurs as well, that it needs no introduction to our readers. In their card elsewhere in our columns special attention is called to this most favored developer.

THE REPRODUCTION OF RED IN OIL PAINTINGS.

WE have received a request for a short note upon the method of reproducing oil paintings with a good deal of red in them. Our correspondent says, "Although I have carefully worked on the lines laid down in your previous notes, I am not satisfied with the reproduction of the reds and oranges in my copies of paintings.

It is an open question whether red should be reproduced as a light pigment when translated into monochrome, but to obtain a more correct rendering is by no means difficult. We must first of all have red-sensitive plates, and for this purpose the red-sensitive plates of Lumiere, introduced by Fuerst, are a great gain. These plates, notwithstanding their increased sensitiveness for red and orange, are not sufficiently sensitive to green, and too sensitive to blue, but we have found the following method give the best results, though somewhat tedious and troublesome. We require a screen which will cut off all the blue, green and yellow rays so as to give the red time to act. Such a screen can be made from ruby glass combined with the second tint of the commercial yellow screens in the market. The ruby glass we use was obtained from Newton and Co., Fleet Street, in $3\frac{1}{4}$ sq. pieces, and, though not perfect, we have found no trouble, provided a fairly small stop, about *f*-16 or *f*-22, be used. With these two glasses and the red-sensitive plates an exposure of one hour should be given; the lens capped or the dark-slide closed and removed, and a new screen of the second tint of the commercial yellow screens used, and about another half an hour's exposure given.

For development of these plates almost any developer except pyro-ammonia, with which we have found a tendency to fog, may be used; but the main point in development is not to put too much reducing agent in at once, or else the blues get far too dense in proportion to the red, and yellows, a fault also found if development is stopped too early. It is a curious fact, and one not generally known in working color-sensitive plates of all

kinds, that it is only when development is sufficiently prolonged that the yellows develop up dense. If stopped too early, only the blues have their true value. In ordinary working this is not so particularly noticeable, but in the preparation of three-color or heliochromic negatives, in making an exposure through a green screen, so as to cut out the red and allow the yellows and blues to act, the images of blue objects appear first and much stronger than the yellow, though if development is carried on long enough the yellows not only catch up but surpass the blues.

—*Amateur Photographer.*

An Artistic Design for Book Cover.—The result of the competition for the twenty-five dollar prize offered by Mr. George E. Barrie to the students of the Academy of the Fine Arts for the best design to be used as a cover of "The Journal of the Edwin Booth Shakespeare League" was made known yesterday. For two weeks there has been a battle royal of wits and brains in order to carry off this honor, and it fell to a woman, Miss Fanny B. Sheaffer. So fierce has been the competition that at least one dozen of the designs were considered first-class, and nine of them were hung in the Antique class-room. The winning design is treated in monochrome, the ornamentation, in light tones, being distributed with good taste over a darker background. In the center there is a medallion of the immortal bard framed in laurel wreath artistically entwined so that a twig and leaf fall carelessly upon his brow, as if the unconscious plant had crowned him king of poets. The decorative borders above and below are tinted as bas-reliefs. Twenty of Shakespeare's prominent men and women are introduced into these borders in a most effective manner and have the appearance of a family clustering around its creator. The idea of Miss Sheaffer is stamped with originality all through, and is carried out with most excellent effect. All of the designs exhibited are complimentary to Mr. Henry Thouron, the teacher of the class, and exhibit wonderful skill and proficiency on the part of the pupils. This is the second competition of the kind presented to the students, and it is hoped that it will soon be followed by others. Some of the large book publishing concerns in this city would profit by offering a prize for covers of books and have the satisfaction of knowing that they were assisting in elevating art.

THE EASTMAN PATENTS.

AN IMPORTANT DECISION BY THE UNITED STATES COURTS.

IN the litigation respecting the validity of the roll-holder patents of the Eastman Company, a final decision has been handed down by Justice Colt, of the Circuit Court of the United States (District of Massachusetts, June 1st, 1894). As this matter is of general interest to the professional as well as the amateur branch of the guild, we give the ruling in full:

COLT J. The two patents in controversy in this case are for improvements in photographic apparatus. The first patent was granted to David H. Houston, October 11th, 1881, and is No. 248,179; the second patent was granted to Walker and Eastman, May 5th, 1885, and is No. 317,049.

In the old photographic camera the plate upon which the image of an object was taken was made of glass covered on one side with a thin film of sensitive material. The film consisted of collodion, sensitized in a bath of nitrate of silver, and exposed while wet. This was known as the wet process. This form of apparatus was cumbersome and difficult to operate in the field.

In 1880 Mr. Eastman, one of the inventors of the Walker and Eastman patents, commenced the manufacture of dry plates; these plates were coated with film composed of an emulsion of gelatine and bromide of silver, and then dried, but they were open to the objections of all glass plates, namely, they were heavy and liable to break.

It was sought to overcome these objections to the use of glass plates by the substitution of strips of sensitized paper supported on rollers.

A camera must be so constructed as to exclude the light, or, as commonly expressed, it must be a light-tight box. It is apparent that where a long strip of material was used it became necessary to devise some means to determine the position and movement of the strip in the camera. This was done by marking off the strip into lengths proper for exposure, before introduction into the camera, and by inserting a colored window in the box through

which the operator could observe the marks on the paper from the outside.

A device of this type, which appeared in 1875, is known as the Warnerke roll-holder, and is described in Abney's *Treatise on Photography*, and other publications. It consisted of a light-tight box containing two rollers and two rounded bars or guides, and the sensitized film was wound from one roller to the other over the exposing bed; one end of each projected through the side of the box and was provided with a mill-head and lock-nut. The sensitized film was previously marked by black patches of paper which could be seen through a colored glass window at the back of the holder.

The defects in this form of construction were: first, it was difficult to mark the strip without injuring it; second, the colored glass window did not form a perfect protection to the entrance of white light into the box; third, it was difficult to observe the division lines on the strips through the window.

In 1877, E. & H. T. Anthony & Company made one roll-holder after the Warnerke pattern, but slightly modified in structure.

There is also found described in a London publication entitled "*Notes and Queries*," published in 1855, what is called "*Captain Barr's Dark Slide for Paper*." In this apparatus, the paper used in connection with the rollers was in short lengths secured to a band of calico, leaving intervals of about two inches between the lengths. The indicating device consisted of a short roller outside of the box fitted to one of the inside rollers, on which was wound a tape of the exact length of the calico strip.

There were numerous defects in this apparatus, and it does not appear to have ever gone into use.

Before the inventions of Houston, and Walker and Eastman, there were two problems which had to be met in the practical use of a long strip of film in a camera,—the sensitized strip must be properly marked and it must be held in sufficient tension. These inventions solved these problems.

The Houston improvement consists in attaching to substantially the old Warnerke roll-holder a device for marking automatically the sensitized material within the camera in such a

manner as to form guides by which the operator can cut the film between successive exposures when taken into a dark room. This is accomplished by placing a pointer outside of the box connected with one of the rollers, which indicates the revolutions of the roller, one revolution measuring half the length of the negative, or two revolutions the whole length. The same roller which carries the pointer also carries a pin which perforates the edge of the material at each revolution, and consequently every other perforation marks the space between the negatives.

By this device something more is done than merely measure the length of film which passes between the rollers. The pointer outside the box indicates accurately when the film has advanced sufficiently for each negative or exposure, at the same time the pin on the periphery of the roller marks the exposed length in such a way that the division line can be readily detected in a dark room.

This was clearly an improvement over anything which existed in the prior art.

The defendant attacks the validity of this patent by the introduction of various old registering devices for measuring cloth and other materials. A type of this class of machines is found in the Dodson patents of January 20th, 1880, and August 3d, 1880, and it is upon these patents that the defendant chiefly relies. The machine of the Dodson patents is for measuring cloth or bagging. The material passes over one roller and under another roller, then over a measuring cylinder to a spindle upon which it is wound; the measuring cylinder has points on its periphery, and a tooth at one end of the cylinder outside of the frame which works with a toothed registering wheel, and another tooth on the inside of the frame which works a click spring; the cylinder is described as being exactly a yard in circumference, and provided with projecting points which enter the bagging and prevent it from slipping. By this device the registering wheel operates to register the number of yards unwound from the roll, while the click spring enables the operator, by counting the clicks, to know how many yards have been unwound.

In all the cloth-measuring and registering devices which existed in the art prior to the Houston patent, as disclosed by this

record, there is not found the special feature of the Houston invention, namely, a projecting pin which spaces off and defines, for the purpose of cutting, a certain given length of the material. Some device of this kind was necessary in a camera using a strip of film, and although such device may be only a modification of old devices, yet as the result accomplished is new, and useful, I think it patentable.

On the question of infringement of the first and second claims of the patent, I have no doubt; the defendant's device embodies the essential features of the Houston invention, and the changes which are made are merely structural.

The Walker and Eastman patent represents a still further advance in the art.

The strip of film ready for exposure must always be kept in a condition of tension. As the camera may be left standing for days, it was found that the film was liable to contract or expand under different conditions of weather, and further, in the old apparatus the devices for holding the film in tension did not always work perfectly.

The object of the Walker and Eastman patent was to remedy this defect.

The inventors spent months of effort before they hit upon the device which is the subject-matter of their patent. The means employed by them were simple, but this fact does not detract from the merits of the invention. The improvement consists in the insertion of a spring in the receiving reel which operates to take up the slack end of the film, or to always draw the film against the resistance of the spool. The spool and the receiving reel with their retarding mechanism, will, under the ordinary process of feeding the film along, hold it in tension; but this is not sufficient to answer all the conditions which arise in the use of the instrument. By the addition of the spring this defect was overcome, and the film maintained in tension under all conditions.

The fact that the Walker and Eastman device has gone into general use, both in this country and abroad, proves the utility of the invention; and if the question of invention were in doubt, this circumstance should weigh strongly with the court in resolv-

ing that doubt in favor of the patentee. *Smith v. Goodyear Dental Vulcanite Company*, 93 U. S. 486, 495; *Consolidated Valve Company v. Crosby Valve Company*, 113 U. S. 157, 171; *Magowan v. New York Belting & Packing Company*, 141 U. S. 332, 343; *Topliff v. Topliff*, 145 U. S. 156, 164.

The validity of this patent is attacked on the same line of defence as the Houston patent. I shall only refer to one of the prior patents which are introduced as anticipations. I confine myself to this because it comes closer to the patent in suit, and is chiefly relied upon by the defendant. This is the Mann patent of August 8, 1876, for improvement in map-racks. In that apparatus there are two rollers close together, and the map is wound from one roller upon the other. These rollers are geared together by either cog or friction wheels, so that on turning a crank the two rollers move in unison. There are also two additional guide rollers situated above and below the center rollers.

The map to be displayed passes from the upper center roller under and over the upper guide roller, then over and under the lower guide roller, back to the lower center roller; the lower guide roller is journaled in slides, which move in the frame work, and springs are introduced above these slides which cause the roller to move downward.

An inspection of the Mann patent demonstrates that the organization of rollers, brakes and springs is quite different from that found in the Walker and Eastman patent. In fact there is nothing in the prior art which anticipates this invention.

The defendant's apparatus, though modified in some particulars, is clearly within this patent, and I am of opinion that it infringes the third, twenty-sixth, twenty-ninth, thirtieth, thirty-first and thirty-second claims.

The phrase "acting to maintain the film in a tense condition during exposure," in the third claim, does not mean, as contended by the defendant, that the tense condition is only maintained during the instant of exposure, but it should be construed as meaning that the film shall always be acted upon by such instrumentalities that when exposure takes place, it will be found in a tense condition. [*Decree for Complainants.*]

COLLOGRAVURE.

UNDER this name, M. Balagny, of Paris, a Frenchman, has invented and published a novel process of producing collographic prints in fatty inks, which is claimed to be very simple and easy to execute, while no special apparatus of any kind is necessary to work it.

He makes use of a special flexible film of his own invention, which is manufactured for him by the house of Lumière Bros., in Lyons. These films are made on a paper or similar flexible support, which is coated with the regular bromide of silver gelatine emulsion like any dry plate, but has received a previous special preparation or coating of his own invention, for the purpose of making the sensitive gelatine film very strongly adhere to its support. Without this precaution the gelatine film would have a tendency to separate and peel off under the action of the roller when the finished plate is ready to be inked. The writer has experimented and tried this new process with good success by using the enamel bromide paper made by the Buffalo Argentic Paper Company. This paper would be excellently adapted to it, but unfortunately the adherence of the film to the paper did not prove to be sufficient, and it came off under the roller.

What is especially characteristic of this ingenious process is the rapidity of all its operations. It is possible to obtain a print by this method in thirty minutes.

The following contains the mode of operation. The paper or films are cut to the desired size, and are immersed one by one into the following bath :

Water	100 parts
Bichromate of potassium	3 "

They are left in this bath to absorb all the liquid they are susceptible to, which takes from five to ten minutes, according to the temperature. The sheets are then removed from the bath one by one, and placed film side down on a plate of thick glass. With a rubber roller or squeegee the excess of the liquid is now

thoroughly squeezed out, and the back mopped off with a rag or soft sponge. In this condition they are left on the glass during three to five minutes; they are then removed from the glass and carried to the dark room, or put in a box where they are allowed to dry in complete darkness. In this condition the films keep well from six to eight days, but they must be carefully guarded and kept from actinic or daylight.

For printing, the ordinary printing frames are used. The negative should be covered with a mask of black or opaque paper to protect the margin of the film about a quarter of an inch all around from the action of the light, the same as in carbon printing. The presence of bromide of silver accelerates the printing considerably, and makes the time of exposure a very short one. After all the details are visible, or, in case of transparent films, when the deep shadows are plainly visible on the back, the film is removed from the frame, placed face down against a piece of black cloth or felt, and exposed from the back from thirty seconds to one minute, but never in sunlight. The films are now washed out in frequent changes of cold water until all the bichromate is thoroughly eliminated. They may remain in the water until next morning. They can also be printed directly after only five minutes washing, but then the resulting pictures are not so fine and deep. The films are finally fixed in: Water, 100 parts; cyanide of potassium, five parts, and rinsed again for ten minutes. Before printing they must be mounted on zinc plates. These should be polished and well cleaned. The surface is then poured over with spirits of turpentine, and wiped off with a special rag. The grease left by the turpentine is then removed by passing over the surface of the zinc a sponge filled with, water ten parts; silica of soda, three parts, and rinsed under the tap, but without touching the surface. A piece of gelatine film, such as are sold in sheets ready made, is dipped in water, placed on the zinc, and pressed in contact with a roller. The printed film is then taken out of the water and placed on top of the plain gelatine film, and also squeegeed in contact with the roller, carefully avoiding foreign bodies and air bubbles. We have then a combination of three surfaces: a sheet of plain gela-

tine, and the film carrying the image, entirely connected and kept together by atmospheric pressure. The adherence is perfect. The mounting can also be accomplished in the following manner: by simply squeegeeing the film to a piece of gelatinized parchment paper, such as is used with the apparatus called the photo-autocopyist, and fastening the whole on the special stretching frame connected with this apparatus.

The surplus moisture is next carefully removed with a soft rag, and then flowed over with a twenty per cent. solution of glycerine in water, which is left to penetrate the film well, and then removed with a sponge. The remaining moisture is again blotted off with a rag, and the plate is ready for inking. This has been described so often that it will be unnecessary to repeat it. The prints can be made in any kind of a press, even in a letter-copying press, but in this to obtain a uniform pressure a sheet of thick rubber must be placed on top of the paper which receives the print.

PHOTOGRAPHED A SPIRIT.

BY AN AMATEUR.

THE appearance of the astral or spirit incasement of a man who had been dead more than a year, in a photograph made with a kodak, was the cause for the almost total suspension of animation on the part of Mr. A. Allen Wheat of this city. He had made a lot of photographs of people and things about the home of his wife, near Danville, Va., and had sent them to the kodak factory to be developed, and received them back a few weeks ago.

Among the lot was a group composed of his wife, his father-in-law, Captain Haase, Miss Maud Halcolm and his brother-in-law Master Charles Haase. The picture was taken at the home of Captain Haase, about ten miles from Danville, and was made by the usual pressure of the button about a month ago. When it was taken, the party were ranged about the veranda of Captain

Haase's residence, the sun shining brightly, and Mr. Wheat, who operated the camera, was stationed about forty feet away. Miss Halcolm, who lives near Captain Haase's residence, and who is a friend of Mrs. Wheat, called on the day in question, and as it was the first time she and Mrs. Wheat had met since the death of Miss Halcolm's brother Charles, they naturally talked about him considerably. After dinner the party repaired to the veranda to make the picture. Nothing unusual was noticed by anyone, and no further thought of the picture was given by Mr. Wheat till he opened the package from the kodak factory, when, to his amazement, he found a perfect likeness of Charles Halcolm standing immediately back of his sister on the veranda.

The figure of Mr. Halcolm and his head are four times as large as those of the other persons in the picture although he is farther away from the camera, being in the extreme background. He wears the clothing which he wore in life—a soft hat, tilted back to show his forehead, as was his custom; black coat and white shirt. He appears to be coming out of the double doors at the back of the veranda, although the picture shows the doors to be closed. He is smiling, and appears to be in the best of humor.

Mr. Halcolm died of typhoid fever a little more than a year ago. He was not a spiritualistic believer, nor was he interested in such things. His family were not spiritualistic people, nor is Mr. Wheat or others who were present at the time the picture was taken. Mr. Halcolm was well known in Wheeling, and nearly all his acquaintances have seen his picture, and all recognized it. Hundreds of others have seen the wonderful picture, and several photographers who have been called in are unable to give any explanation of the phenomenon.

Mr. Wheat, who made the picture, is the head of the firm of Wheat & Hancher, jewelers of the city, and a man of stability and merit. He is not a photographer, and merely took the camera along on his recent visit to get some views of his wife's homestead. The negative plate is in his possession, having been sent back by the people who developed the pictures. It shows the same figures as the photograph.—*Wheeling Letter in Richmond Dispatch.*

ORTHOCHROMATIC PHOTOGRAPHY.

THE DEVELOPMENT OF COLOR SENSITIVE PLATES. By H. W. Vogel. The author points out that one of the most frequent mistakes in practice is taking the plate out of the developer too soon, as the action of the blue rays is developed first, and only later that of the yellow, and it is only if the development is carried on sufficiently long that the full action of the color sensitizing becomes apparent.

NEW SENSITISERS FOR GELATINO-BROMIDE OF SILVER. By Dr. Eder and E. Valenta. The authors summarize the results of their experiments on some of the newer dyes. 1. Rose bengal of bluish shades obtained from the Badischen anilinfabrik and Grothe of Basle sensitize further towards orange than the earlier varieties. The best was tetraiodotetrachlorofluoresceine, which, when used as a bath for plates in suitable concentration (1 g. in 500 cc. water, of this $\frac{1}{2}$ ccm. diluted to 100 ccm. water with 1 per cent. ammonia added), gave a maximum in the green yellow and a distinct sensitizing effect to $D\frac{1}{4}$ C could be recognized. They recommend the use of this dye when greater orange sensitiveness is desired. The total sensitiveness of the plate is somewhat lower than erythrosin plates.

2. Rhodamin dyes. Ordinary rhodamin is allied to the eosins, and sensitizes gelatine plates in the yellow-green between E and D. It has the formula $O < \begin{smallmatrix} C_6 H_3 NR_2 \\ C_6 H_3 NR_2 Cl \end{smallmatrix} > C-C_6(2)H_4-COOH$, in which R represents methyl and ethyl. By treating with mineral acids new and more bluish dyes, "ethylated rhodamines" are formed of the formula $O < \begin{smallmatrix} C_6 H_3 NR_2 \\ C_6 H_3 NR_2 Cl \end{smallmatrix} > C-C_6(2)H_4-COOR$. These dyes are called by the Badische anilinfabrik rhodamin 3 B; the pure preparation is "tetraethyl-rhodaminaethylester" (hydrochloric salt). It dissolves in water with a violet-red color and beautiful orange-red fluorescence. Used as a bath of the composition of the above mentioned strength it renders gelatine plates sensitive to greenish-yellow, yellow and orange; the maximum of sensitizing action lies at $E\frac{3}{4}$ D and extends to $D\frac{1}{3}$ C. Two violet-red strong bluish rhodamins also act well, (a) tetrachloro-tetraethyl-rhodaminchlorhydrate obtained from the Gesellschaft fur chemische Industrie in Basle produces a strong sensitizing action of green, yellow, and orange, the sensitizing maximum begins before D in the yellow-green ($D\frac{1}{3}$ E), and extends into the orange-red ($D\frac{1}{2}$ C). With tetrachloroethylrhodamid-methylether

the maximum extends still further into the orange. It produces a small maximum in the green between E and D, the second stronger maximum begins in the yellow-green ($D\frac{1}{2}$ C to $D\frac{2}{3}$ C). (b) A bluish preparation obtained from the Badische anilinfabrik, called Nitrilo Rhodamin, shows sensitizing maximum nearer the red, the orange sensitiveness extends to $D\frac{1}{2}$ C; behind a copper red screen these two dyes gave with ease the lines B and C, and traces of A. The relative blue sensitiveness is greater with these than with erythrosin and rose bengal. The orange-red sensitiveness is not so great as when cyanine is used, but the general sensitiveness is greater, and these dyes will be of great value for orthorhombic work, and for spectrum photography, as the lines in the neighborhood of D are sharper.

3. Acridine dyes.—Acridine yellow, obtained from Leonhard Mühlheim, which is hydrochlorate of diamido-dimethylacridine, is soluble only with difficulty in water, more easily in hot alcohol, and gives a yellow color with intense green fluorescence. For sensitizing a saturated alcoholic solution mixed with an equal quantity of water should be used without ammonia. Gelatine plates thus sensitized show the highest green sensitiveness yet met with, from $D\frac{1}{2}$ E into the violet. Acridine yellow will be useful not only for spectrum photography, but also for color printing.

THREE-COLOR PROCESS. By H. Hruza. The author sums up his previous papers on this subject, and gives the following table of details:

Printing Ink.	Screen.	Plate Sensitizer.	Commercial Dry Plates.	
Cadmium yellow, light chrome yellow.	Ethyl violet + rhodamin.	Cyanin' chlorophyll R. dye of Albert's emulsion.	Lumière's red sensitive plate. Edward's iso plate.	Yellow plate.
Purpurin lake, red lake, Kraplack O.	Copper chloride + copper sulphate.	Spriteosin' P. dye of Albert's emulsion.	Vogel Ober-netter's eoside of silver plate.	Red plate.
Milori blue .	Bordeaux C. O. V. Ponceau 4 R.B.	Cyanin' chlorophyll R. dye.	Lumière's red sensitive plate.	Blue plate.

THREE COLOR PRINTING. By Baron Hübl. After a short *résumé* of the history of the various attempts to reproduce colored objects in colors by pigment printing in three colors, the author goes on to point out that as regards the choice of printing inks, they must be such that when deeply printing one on the top of the other they shall yield black, while if printing as half-tones of equal intensity they shall yield grey. They must besides be as transparent as possible, stable in light, and suitable for printing. The production of a grey is not easy, although black is easily obtained. If, for example, Paris blue, chrome yellow, and eosin lake be the inks employed, owing to a broad space between the absorption bands of the blue and red pigments the resulting shade is yellow-brown. Each color should absorb about one-third of the spectrum and reflect two-thirds, a condition which is fulfilled by a pure yellow, about a medium chrome yellow or yellow lake, and by milori blue. There is no red color at present which fulfils this condition. The yellow printing plate should be sensitive from the violet end to the beginning of the blue-green, a condition which is not completely satisfied by the ordinary or undyed plate, the sensitiveness of which for the blue rays is too low. No practical difference exists between gelatine emulsion, collodion emulsion, or wet collodion plates in this connection. The plate for the red printing should be sensitized for the yellow, green, and blue-green parts of the spectrum, a perfect sensitizer for which is at present unknown, the eosins which are most suitable reproducing the blue-green and blue pigments too thin, and preventing thereby the perfection of the green shades. For the blue printing negative, chlorophyll answers better than cyanin. To neutralize as much as possible the violet and blue sensitiveness of silver bromide when preparing the red and blue printing negatives, picric acid solution is recommended with collodion emulsion plates. For the red printing negative a solution of nickel sulphate answers well, but a reddish-yellow filter such as aurantia should not be used, since this curtails the green rays, and favors the blue-green to too great an extent. A concentrated solution of cupric chloride, as recommended by Weissenberger for the filter for the red print, is correct if the plates show too great a sensitiveness to the yellow. If a plate sensitized with cyanine be used for the negative for the blue print, the action of the violet-blue rays must be eliminated, and means taken to counteract the yellow sensitiveness of such a film, which can be done by employing a filter containing a mixture of potassium chromate and rose bengal solutions. If, on the other hand, the plate be sensitized by chlorophyll, a picric acid filter will be all that is required.

Baron Hubl strongly recommends the practice of always photographing a small color chart with the original.

In printing, the yellow should be printed first, then the red, and finally the blue. The three-color process in his opinion cannot yield an absolutely faithful reproduction of the original, since the fixed absorption bands of the printing inks cannot be so closely matched with the absorption curves of the colors to be reproduced as to obtain copies true to the original. The perfect equality of the pulls necessary in the preparation of a number of prints presents the greatest difficulty. Every little irregularity influences the final appearance of the print to an enormous degree. For this reason the collotype steam press is better than the hand press, and the ordinary type-press ought to be still better.

YELLOW SCREENS IN ORTHOCHROMATIC PHOTOGRAPHY. By W. K. Burton. The author recommends a screen placed in contact with the sensitive surface, made by coating "patent plate" with gelatine colored with ammonium picrate. To prepare the coating solution, ammonia is added to a saturated solution of picric acid until the odor indicates an excess of alkali; the solution is diluted with half its bulk of water, and twenty grains of gelatine to the ounce is added. The colored film is preferably varnished.

World's Fair Pictures.—Although the Columbian World's Fair has passed into history, the popular interest in that great exhibition has not abated, and there is a general desire to perpetuate the memory of its many beauties by picture and description. The great development of the art of photography enables this to be done in a more effective way than was ever possible before, and the modern processes of reproduction now enable publishers to furnish what are known as half-tone prints so cheaply as to put them within the reach of all. Several of the enterprising newspapers in town and country have recognized the educational value of the World's Fair views and have been at some pains and expense to introduce them to their reader's attention. They have advertised them freely, and a system has been arranged by which these views have been sold at the low rate of ten cents, and one or more newspaper clippings for a portfolio containing sixteen plates.

LANGUAGE OF PRECIOUS STONES.

THE ancients attributed marvellous properties to many of the precious stones, and particular gems have been marked by their own distinguishing fables. The same notions have more or less continued down to times not long past. We give in tabular form the different months and the stones sacred to them, with their respective legendary meaning. It has been customary among lovers and friends to notice the significance attached to the various stones in making birthday, engagement and wedding presents.

JANUARY.—*Garnet*.—Constancy and fidelity in every engagement.

FEBRUARY.—*Amethyst*.—Preventive against violent passions.

MARCH.—*Bloodstone*.—Courage, wisdom and firmness in affection.

APRIL.—*Sapphire*.—Frees from enchantment ; denotes repentance.

MAY.—*Emerald*.—Discovers false friends and insures true love.

JUNE.—*Agate*.—Insures long life, health and prosperity.

JULY.—*Ruby*.—Discovers poison ; corrects evils resulting from mistaken friendship.

AUGUST.—*Sardonyx*.—Insures conjugal felicity.

SEPTEMBER.—*Chrysolite*.—Frees from evil passions and sadness of the mind.

OCTOBER.—*Opal*.—Denotes hope and sharpens the sight and faith of the possessor.

NOVEMBER.—*Topaz*.—Fidelity and friendship ; prevents bad dreams

DECEMBER.—*Turquoise*.—Prosperity in love.

We append a list of precious stones in common use not included in the above.

Moonstone.—Protects from harm and danger.

Diamond.—Faith ; innocence ; virginity.

Heliotrope.—Causes the wearer to walk invisible.

Pearl.—Purity ; gives clearness to physical and mental sight.

Catseye.—Possesses the virtue of enriching the wearer.

Rather skin a carcass for pay in the public streets than be idly dependent upon charity.—*Talmud*.

Photographic Hints and Formula.

The best chemical ink recommended for writing on silver prints is the following :—

Potass. iodide	10 parts.
Water,	30 “
Iodine,	1 “
Gum arabic,	1 “

This should be used after toning, but before fixing, or, if used after fixing, hypo must be again applied to dissolve out the iodide.

Sepia Tone on Chloride Prints.—By E. Valenta. The writer states that fine red tones can be obtained on chloride prints by treating with

Thiosinamin	5 grams.
Water	5.0 c.c.
Sol. granium nitrate 10 per cent.	5.10 c.c.

The prints are treated with this, well washed, and then toned.

Total Local Reduction.—By A. Lainer. The author suggests painting negatives and bromide prints where lines or spots are required to be totally removed with

Potassium iodide	2 parts
Water	2 parts

To which sufficient iodine in crystals has been added to make the solution dark brown. The parts painted with this are converted into silver iodide, which is dissolved by subsequent fixing.

A Hint to Picture Dealers.—All who have show windows to make attractive will be interested in the following on window dressing: The art of window dressing, like the methods of making magazine illustrations, is improving with age. Five years ago, the down-town retail merchant would not have believed it possible to present so many attractive window pictures in his store front as are given to-day, and, mayhap, five years hence he will think scornfully enough of the pretty show displayed in this year of grace, while comparing it with the gorgeous mounting then apparent. All of which suggests the thought that perhaps as a people we are slowly working up to that national school of art at the lack of which foreigners so greatly deplore in Americans. Thousands of dollars are spent annually in Chicago in

dressing shop windows, and particularly those that grace the fronts of the palatial stores that line State Street and Wabash Avenue. While the display this year is not so general or so insistent as during the Christmas season of a year ago, yet the discriminating observer will not say that it is less interesting. England may be a nation of shopkeepers, but she might send her merchants to Chicago, with great profit to themselves, to take cognizance of the manner in which their American brethren display their wares to catch the passing eye. Especially is this likely to be the case during holiday week,—that great holiday of the year when Christmas gifts and Christmas joys should, like the rain from heaven, fall upon the just and the unjust.—*Picture and Art Trade*.

The Use of Vanadium in Actinometry.—By R. E. Liesegang.

A concentrated aqueous solution of ammonium vanadate mixed with its own bulk of a twenty-five per cent. solution of tartaric acid, gives a reddish yellow liquid permanent in the dark, and changing by about twenty minutes exposure to sunlight to a dark olive color, further to green, and finally to blue. The exposed solution may be titrated with permanganate for quantitative results.

Faces and Costumes.—How the numerous photo-mechanical processes are utilized in the various departments of the daily press is becoming more and more apparent every day. First we have the direct illustration of current events in the regular issue. Now the country is being flooded with half-tone "Souvenirs." Here is the latest announcement of one of the great New York dailies. "Portraits Types of all Nations" is the title of a superb collection of large photographic character studies, comprising eighty striking portraits of people from all over the world. Each face is a study to the ethnologist as well as a delight to the artist and connoisseur. Each plate of the entire series is worthy of framing as a delineation of unique costume alone. From this standpoint they form an endless source of family entertainment. This series is distributed practically free to readers of this paper. It is only necessary to send one dime, to cover cost of tubing, postage, handling, etc., and a clipping of this article, to show you are a *World* reader, and any desired portfolio is yours.

Production of Colours in Glass.—According to *Die Glashute*, the beautiful colouring of certain varieties of glass now produced in Germany, and which far excels some of the most noted French specimens, is an art practised by the glassblower at the furnace, by means

of an apparatus consisting of a sheet iron cylinder, 20 inches long and 8 inches diameter, standing vertically, and having a similar cylinder riveted across the top, thus forming a T-shaped muffle. In the lower cylinder is an opening into which an iron ladle can pass; and the horizontal cylinder is provided with doors at either end, the one nearest the operator being so arranged that the blowpipes can be supported when the door is closed in a horizontal split running to its middle, the object to be treated being held aside. While the glass-blower is reheating his work for the last time in the furnace an attendant takes the long-handled iron ladle, which has been heated red-hot, shakes into it about a spoonful of a specially prepared chemical mixture, and places the bowl of the ladle quickly in the opening provided for it in the vertical cylinder. The mixture immediately gives off vapor, which rises to the horizontal cylinders, where, meanwhile, the blower has placed his work, supported by the blowpipe, and heated to an even red, turning it rapidly in the vapour; in a short time the object is covered with a changeable lustre, is removed from the pipe and tempered like other ware in an ordinary oven, engraved, painted, or gilded, as desired.

Exposure Meter.—A. Watkins has lately patented in England some improvement in instruments for calculating photographic exposures.

To Secure Permanent Pictures.—Sig. A. Corsi, in *Bullettino della Societa Fotografica Italiano*, lays down the following rules for those who wish to secure permanent pictures. 1. The prints should be fixed in a fresh 10 per cent. solution of hyposulphite of soda, in a subdued light; care being taken that fixation is complete. 2. They must then be transferred to a second bath of hypo, exactly similar to the first, and left there for a similar period. 3. They must then be washed in water for not less than ten minutes.

Process Work.—We learn from *The Amateur Photographer* that it is rumored that an exhibition of process work and materials will be held in London shortly. This branch of photography is one which is, possibly more than any other, making rapid strides, and the use made of process work by the daily and weekly illustrated journals is very great.

Direct Reproductions.—A new, and, it is said, improved method has been patented of preparing drawings and photographs for reproduction, by I. J. Robie.

Photographic Scissors and Paste.

Telescopes of the Future.—In a paper by Mr. Alvin A. Clark on the telescopes of the future, recently read at Chicago, the view is suggested that astronomers may look forward to the possession of instruments vastly more powerful than any they now possess. When in 1846 lenses 15 inches in diameter were made astronomers thought the limit of size had been reached. But in 1870 Mr. Newhall, of England, built the 25-inch telescope now at Cambridge. In 1878 26-inch glasses were made for the telescopes at the University of Virginia and at the National Observatory at Washington. Till recently the difficulty of getting suitable glasses was the chief obstacle. Glassmakers, have, however, continued to improve their processes for producing discs of glass of large size and free from imperfections. Perseverance has at length brought matters to the point that the only obstacles to getting glasses of "almost any size" are the time required to make them and the small number of persons having money enough to pay for them. This fact is illustrated in the increase of size of lenses in great telescopes in recent years. The 30-inch glass ground in 1880 for the Russian Imperial Observatory at Pulkowa was succeeded in about 1887 by the 36-inch Lick telescope. At present Mr. Clark has under way the largest lenses ever constructed, of forty inches diameter, for the University of Chicago. Instruments of this prodigious size are required, Mr. Clark thinks, for original discoveries. Most important original discoveries have been made with the largest telescopes in use at the time. Once seen with the large glass new objects are readily made out afterwards with smaller instruments. The fewness of large telescopes has greatly restricted the number of original discoveries. Reflecting telescopes will not, in Mr. Clark's opinion, complete successfully hereafter with refractors in power. The large telescopes of this class have rarely, he says, accomplished much except in the hands of opticians who made them. They are extremely sensitive to unfavorable conditions that affect the use of high magnifying powers. The tendency is to displace the reflecting telescope. But makers of the great lenses of refracting telescopes have great difficulties to overcome. They are able now to procure the great discs required, but to figure them—to give them the proper shape—and to polish them requires the highest skill of the scientific optician. "He must be an artist in color," says Mr. Clark, "as well as in light and shade, in order to do

the perfect work required." The task is a hard one, and its difficulty increases with the constant increase of size. Machinery is available for the rough work of the first stages of manufacture, but the fine grinding and smoothing are always done by hand. The finishing touch can never, it is thought, be given otherwise than by hand.

Signatures on Pictures.—As to signatures, now that pictures have become an extremely valuable commercial commodity, a signature is of the greatest importance. It is all very well to say of a picture that it is "signed all over." Many pictures are unmistakable in style. But everybody is not an acute judge of style. If a man buys a picture because he fancies it and doesn't care by whom it was painted, the signature is nothing to him. But he has no right to demand that others shall accept it as a work by a certain man because he chooses to think so. It is his duty to prove as well as assert it. A signature makes a picture intrinsically no better nor worse. But it is a link in its chain of identification that affords its possessor satisfaction, and costs the artist no expense of time or money. Nowadays the drift of pictures is like that of wreckages on the sea. They wander all over the world, finding lodgment, perhaps, in many places and passing through many lands. Finally they settle in special collections, here, there, and everywhere. One of these collections comes to be broken up. The public is invited to buy. Who is this forest scene by? Jones. It is signed. Very well, but what is it? Don't know. You must buy it as what it is. All right, if it is a good picture; but how much more interesting would it be to you if you knew it was a subject from Fontainebleau, or the Schwarzwald, or the New Forest, or some other known locality. How much would you be interested in a novel which had no title and the characters in which no names?

The average artist will doubtless fall back on the excuse that all this is a mere matter of business. But, as far as the public is concerned, the bargain and sale of pictures is business. While a picture is on the easel, we will say, it is a matter of art alone. It is the property of its creator only, to be made or marred according to his ability and fancy. The moment he offers it for sale, however, it acquires an additional quality. It is not only a matter of art but a matter of commerce, and as an object of commerce it requires to be handled under sensible commercial rules. — *The Collector.*

The Photographic Reprints.—Our readers may possibly call to mind that when the last edition of the *Encyclopædia Britannica* was published, a copy was produced in America, the pages of which were

not set up by the printer but produced photographically—a species of piracy which was much commented upon at the time.

A good story concerning these photographic copies of the bulky volumes is told in the *Publishers' Weekly* (New York). A bookseller was trying to sell a *Chambers's Encyclopædia* instead of a *Britannica*, which he did not happen to have in stock; and, by way of deprecating the latter, he said that the American edition was “nothing but a photograph anyhow, and that the matter, compared with the original, was but poor stuff.” Many are the sins laid upon the broad back of photography, but it is new to hear that printed matter so deteriorates under its influence.

An Infallible Witness.—Coroner's Physician Mattern, who was the first to photograph a murdered man's wounds, was talking about it the other day, when he said: “A picture proved very valuable in the case of an Italian who was murdered in Manayunk. The attorney for the accused contended that his client was in front of the man he murdered, when he struck backward in self-defense, and hit him in the neck. When I produced the photograph, which showed the wound to extend from the back of the neck forward, the lawyer gave up, and admitted that, as the photograph couldn't lie, his contention was groundless.”

RECENT PATENTS.

THE following list of patents relating to the photographic interests, issued by the U. S. Patent Office, during the past month, is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, 925 F Street, N. W., Washington, D. C.

523,323.—Photography by artificial light, B. M. Clinedinst, Washington, D. C.

524,143.—Camera shutter, J. C. Hegelein, New York, N. Y.

524,142.—Photographic camera, J. C. Hegelein, New York, N. Y.

524,949.—Magazine camera, J. F. Parsons, Bristol, England.

524,726.—Photographs, coin-released actuating mechanism for, G. T. Waldron, Quincy, Mass.

524,921.—Photograph mounts, device for cutting cards with beveled edges for, B. McHugh, Ottawa, Canada.

DESIGN PATENTS.

23,518.—Photographic card mount, J. P. Odgers, assignor to A. M. Collins Manufacturing Company, Philadelphia, Pa.

23,519.—Molding for picture frames, Jas. Booth, West Brighton, assignor to White, Potter & Page Manufacturing Company, Brooklyn, N. Y.

In the Twilight Hour.

BATTLES are thoughts insisted upon.

AS soon as sin begins, life becomes a lie.

WHEN a man takes a drink of whisky he bids God good by.

THE man who is not against the saloon is not against the devil.

A LOST fortune can be recovered, but lost time is gone forever.

FILL your life so full of good that there shall be no room for evil.

A MODERATE drinker is worth more to the devil than a drunkard.

EVERY drunkard used to boast that he could drink it or let it alone.

OBEDIENCE to God is the highest evidence that we believe in him.

THERE is plenty of employment for those who want to make others happy.

GOD finds it hard to bless a man who looks at everything through money.

IT is better to go afoot to heaven, than to be drawn in splendor to perdition.

THE devil has no better helper than a bad man who is considered righteous.

YOU will find God just as soon as you become willing that He shall find you.

IF you love the Lord, don't send your preacher to sleep in a damp feather bed.

CHRIST has no better friend than the mother who teaches her children to pray.

EVERY opportunity to do good is a blessing if improved, a curse if neglected.

DELIBERATE with caution, but act with decision; and yield with graciousness or oppose with firmness.

THAT man will always have a stormy passage, who starts out to run away from God.

A LITTLE skin-deep beauty is often preferred to Jesus Christ.

IT is hard to find a Christian who praises the Lord enough.

IF you would not be known to do a thing, never do it.—*Emerson.*

LOSSES for Christ's sake are goods lodged in the bank of heaven.

NEVER be found living where you would not be willing to be found dead.

A THIRST has often been started with a teaspoon that barrels could not quench.

THE devil goes to church every time some one joigs to help along his business.

THE last promise in the Bible is an offer of salvation to every one who will have it.

WHENEVER you see a drunken man it ought to remind you that every boy in the world is in danger.

THERE are people who claim not to believe in a hell who live in plain sight of a drunkard's home.

WHEN somebody appears to prove that there is no hell, whisky men are the first to throw up their hats.

TOO often giving is only a lazy way of satisfying conscience. "Blessed is he that considereth the poor."

THE prodigal had to travel a long way from his father's house before he could be made willing to return.

GLORIOUS, indeed, is the world of God around us, but more glorious is the world of God within us.—*Longfellow.*

WHEN you rise in the morning, form a resolution to make the day a happy one to a fellow-creature.—*Sydney Smith.*

A HEAD properly constituted can accommodate itself to whatever pillows vicissitudes of fortune may place under it.

